

Name: \_\_\_\_\_

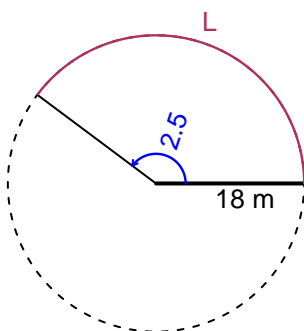
Date: \_\_\_\_\_

## Trig Final (TEST v603)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 2.5 radians. The radius is 18 meters. How long is the arc in meters?

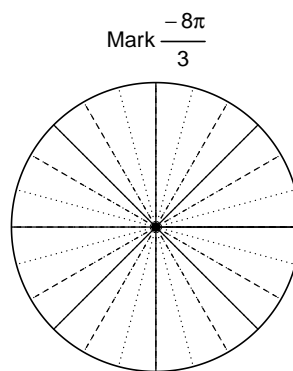


### Question 2

Consider angles  $\frac{13\pi}{4}$  and  $\frac{-8\pi}{3}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\sin\left(\frac{13\pi}{4}\right)$  and  $\cos\left(\frac{-8\pi}{3}\right)$  by using a unit circle (provided separately).



Find  $\sin(13\pi/4)$



Find  $\cos(-8\pi/3)$

**Question 3**

If  $\tan(\theta) = \frac{77}{36}$ , and  $\theta$  is in quadrant III, determine an exact value for  $\cos(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with a frequency of 9 Hz, a midline at  $y = -4.88$  meters, and an amplitude of 7.34 meters. At  $t = 0$ , the mass is at the midline and moving up. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).